

**APPLICATION FOR A UNITED STATES PATENT**  
**UNITED STATES PATENT AND TRADEMARK OFFICE**

Title: A Lateral Track Movement System

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## **FIELD OF THE INVENTION**

This present invention relates to a structure for display screens that allows for lateral movement along the ceiling of a motor vehicle while utilizing a dockable connection for the display screens.

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## **BACKGROUND OF THE INVENTION**

Display screens have become very popular in passenger motor vehicles. These screens allow passengers to enjoy entertainment while riding in the vehicle. The screens are typically mounted to the ceiling of motor vehicles generally in front of the passenger seating area and can either have the display screen fixedly mounted to the ceiling of the motor vehicle or can allow for some slight movement of the screen. For example, many screens pivot 180 degrees around an axis for stowing the screen flat against the vehicles' ceiling and then pulling the screen down again for viewing. Consumers have liked this feature because the screen can then be accessed only when needed.

One problem these screens is that the screen cannot be moved from its fixed position on the ceiling. Therefore, while passengers may be able to pivot the screen for more comfortable viewing, they have not been able to physically move the screen to a more desired location. Since the display screens have been fixedly mounted to the ceiling of motor vehicles, some passengers have experienced obstructed viewing of the screen; others have found that while they want to enjoy entertainment while riding in the car, their co-riders may not be interested in viewing the screen at the same time. As a result, there has been a demand for a way of moving the display screen to varying positions on the ceiling so that passengers have the freedom to position the display screen at any variety of locations along the ceiling. Known display screens have not been able

to meet consumer demand. The present invention acknowledges consumer demand and provides a solution to this common problem encountered by passengers. This invention also allows passengers to continue using a screen that pivots in all directions and utilizes a dockable connector.

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### **SUMMARY OF THE INVENTION**

A lateral movement track system for a display screen utilizing a dockable connector, in accord with the invention, comprises an upper reinforcement assembly, a carrier assembly, a lower reinforcement assembly, at least one wire, and a spool. This lateral movement track system is mounted to the ceiling of a motor vehicle in a position  
10 generally forward and parallel to the passenger seating areas.

In accord with this invention, the upper reinforcement system comprises an upper base, at least one track rail, and a carrier assembly. This carrier assembly comprises a tube, a locking assembly, and the dockable connector. The lower reinforcement assembly comprises a lower base, trim, at least one rib attached to the lower base, and a  
15 spool. The wire runs through the ceiling and upper reinforcement assembly into the carrier assembly, dockable connector, and the spool.

The carrier is slidably associated with the upper base and track rail. The carrier assembly with the dockable connector is locked into places along the track rail by engaging over the at least one rib fixedly attached to the lower base

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These and other objects and advantages of the present invention will be more readily understood after a consideration of the drawings and the detailed description of the preferred embodiment which follows.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a side rear view of a display screen mounted with the dockable connector to the lateral track movement system within the motor vehicle.

FIG. 2 is a cross-sectional view of the lateral track movement system.

5 FIG. 3 is an exploded view of the locking assembly.

FIG. 4 is a depiction of the upper spring loaded lock engaged over the at least one rib.

FIG. 5 is an exploded view of the parts involved in the lateral track movement system.

## **10 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring initially to FIG. 1, the display screen 12 is shown for use inside a motor vehicle 8, preferably, but not necessarily, mounted to the ceiling in a position generally forward of the passenger seating area (not depicted). The display screen 12 utilizes the dockable connector 14 while sliding on lateral track movement system 10.

15 Referring now to FIG. 5, the lateral track movement system comprises an upper reinforcement assembly 36, a carrier assembly 40, a lower reinforcement assembly 38, at least one wire 34, and a spool 32. The upper reinforcement assembly 36 comprises an upper base 16, at least one track rail 18 and a carrier assembly 20. The upper reinforcement assembly 36 is fixedly attached to the ceiling of the motor vehicle 8 by the  
20 upper base 16. Referring now to FIG. 2, this upper base 16 is mounted to the roof bow 42 for a strong support. At least one track rail 18 is then attached to the upper base 16. In its preferred embodiment, this invention will utilize two track rails 18.

Referring to both FIG. 2 and FIG. 5, slidably mounted to the two track rails 18, is the carrier assembly 20. The carrier assembly 20 comprises a tube 50, a locking assembly 46, and the dockable connector 14. The locking assembly 46 comprises the spring 22 loaded upper lock 24 and the lower lock 26. Within the locking assembly 46, there is a spring 22 loaded upper lock 24 positioned into the tube 50 of the carrier assembly 20. A portion of the dockable connector 14 is attached to the spring 22 loaded upper lock 24, which in turn is fitted through the lower reinforcement assembly 38. Once through the lower reinforcement assembly 38, the spring 22 loaded upper lock 24 is joined to a lower lock 30 and completes the connection for the dockable connector 14. The display screen 12 is mounted to the dockable connector 14.

Referring to FIG. 5, the lower reinforcement assembly 38 comprises a lower base 26, trim 28, and at least one rib 48. The lower base 26 provides further support for the carrier assembly 20 and the lateral movement track system 10 as a whole. Depicted in FIG. 2, the trim 28 is snapped over the lower base 26 and headliner 40 mainly for aesthetic purposes. Fixedly attached to the lower base 26 is at least one rib 48. For purposes of this invention, the preferred embodiment will have more than one rib 48 for more positioning locations.

The locking assembly 46 engages onto a rib 48 to hold the carrier assembly 40 in a locked position. If a passenger desires a new position for the display screen 12, the passenger simply needs to disengage the locking assembly 46 by pushing the lower lock 30 in an upwards position. This upward motion, as shown in FIG. 3, in turn pushes up on the upper lock 24 and spring 22. Once this occurs, the carrier assembly 40 is free to slide until it hits its next rib 48. When the carrier assembly 40 approaches the rib 48, it slides

up on the rib 48 and snaps down over it. This action allows the passenger to enjoy lateral movement for the display screen 12 so that he or she can attain any number of desired positions. This locking assembly 46 does not interfere with the dockable connection 14 or the electrical connection that is made within the dockable connection 14. The spring  
5 22 that is loaded onto the upper lock 24 ensures uninterrupted electrical connection within the dockable connector 14. FIG. 4 depicts the upper lock 24 engaged over a rib 48.

In this invention, it is extremely important to provide the adequate electrical wiring so that the display screen 12 will play. To provide this electrical connection, there  
10 is at least one wire 34 that is fed down into the lateral track movement system. In its preferred embodiment, this invention will utilize a dockable connection 14 so that the electrical components will be easily accessed. This dockable connection 14 will make its electrical connection once the male connector 44 and the female connector 52 join. The connection point will not be up in the ceiling or side panels as many display screen  
15 systems do.

So as to prevent wire entanglement, there is a spool 32. As the carrier assembly  
20 slides along the two track rails 18 it is apparent that the wiring for the display screen 12 will need to be contained so as to ensure smooth movement along the two track rails 18. As the carrier assembly 20 slides, it either feeds the at least one wire 34 either into or  
20 out of the spool 32.

The above presents a description of the best mode contemplated for carrying out this invention. The claims should not be read as limited to the described order or elements unless stated to that effect. Therefore, all embodiments that come with the

scope and spirit of the following claims and equivalents thereto are claimed as the invention.